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EXAMINER
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RUTLAND WALLIS, MICHAEL

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PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* FRANK ATHARI

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Appeal 2009-002507  
Application 10/650,246  
Technology Center 2800

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Decided: January 7, 2010

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Before MAHSHID D. SAADAT, THOMAS S. HAHN  
and ELENI MANTIS MERCADER, *Administrative Patent Judges*.

SAADAT, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134(a) from a Final Rejection of claims 2-13, which are all of the claims pending in this application as claim 1 has been canceled. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

## STATEMENT OF THE CASE

Appellant's invention relates to switching mode power supplies (SMPS) and active electromagnetic interference (EMI) filters for such power supplies and converters (Spec. 1:8-13). According to Appellant, a problem with switching mode power supplies is that because of the high frequency of the switching action of the semiconductor switches, EMI is generated and radiated or conducted back to the power source (Spec. 1:17-20). Appellant disposes an active EMI filter at the output of the switching stage that reduces the physical size of the output EMI filtering and minimizes power loss (Spec. 2:19-27).

Independent claim 8 is illustrative of the invention and reads as follows:

8. A circuit arrangement comprising  
a power transistor switching stage providing an output voltage  
and  
an active EMI filter having first and second input terminals and  
first and second output terminals and a ground return line connected  
to a ground return line terminal, the input terminals of the active EMI  
filter being connected to receive the output voltage of the power  
transistor switching stage and the output terminals of the active EMI  
filter providing a filtered output voltage,  
wherein the power transistor switching stage is a switch mode  
power supply and the active EMI filter cancels common mode current  
that flows between the input terminals and the output terminals,  
substantially eliminating any current due to the common mode current  
in the ground return line connected to the ground return line terminal.

The Examiner relies on the following prior art references in rejecting the claims:

Ohkawa

US 5,321,299

Jun. 14, 1994

Sato	US 5,731,689	Mar. 24, 1998
Suzuki	US 6,067,243	May 23, 2000
Pelly	US 6,636,107 B2	Oct. 21, 2003 (filed Mar. 23, 2001)
Kolar	US 6,700,806 B2	Mar. 2, 2004 (effectively filed Jul. 12, 2001)

Claims 3-6 and 8-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pelly in view of Kolar.

Claims 7 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pelly in view of Sato.

Claim 2 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Pelly in view of Sato and Suzuki.

Claim 2 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Pelly in view of Kolar and Ohkawa.

Rather than repeat the arguments here, we make reference to the Appeal Brief (filed May 20, 2008), the Reply Brief (filed Aug. 26, 2008), and the Answer (mailed Jun. 26, 2008) for the respective positions of Appellant and the Examiner. Since no claims are argued separately from the others, we decide this Appeal on the basis of representative independent claim 8. *See* 37 C.F.R. § 41.37(c)(1)(vii) (“When multiple claims subject to the same ground of rejection are argued as a group by appellant, the Board may select a single claim from the group of claims that are argued together to decide the appeal with respect to the group of claims as to the ground of rejection on the basis of the selected claim alone.”). Further, only those arguments actually made by Appellant have been considered in this decision. Arguments which Appellant did not make in the Briefs have not been considered and are deemed waived. *See id.*

## ISSUES

With respect to the claim rejection over Pelly and Kolar, the Examiner relies on Pelly for disclosing a switching stage and an active EMI filter wherein the output of the EMI filter provides a filtered output voltage canceling common mode current (Ans. 4). The Examiner further relies on Kolar for teaching a transistor-based switching stage and concludes that using the power transistors of Kolar in Pelly would have been obvious to one of ordinary skill in the art (Ans. 4-5). Appellant argues that the references provide no suggestion or motivation for the combination proposed by the Examiner (App. Br. 7-8).

With respect to the rejection over Pelly and Sato, the Examiner again relies on Sato for teaching a power transistor switching stage that was indicated to be missing in Pelly (Ans. 6-7). Appellant contends that, similar to Kolar, Sato provides no suggestion or motivation to one of ordinary skill in the art for substituting the full bridge rectifier of Pelly with the power transistors of Sato (App. Br. 8).

Thus, Appellant's contentions and the Examiner's arguments present the following issues:

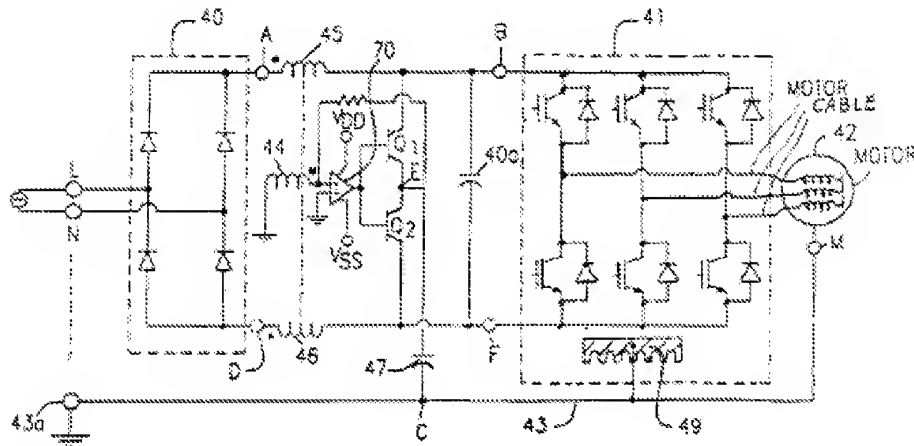
1. Has Appellant shown that the Examiner erred in combining the teachings of Pelly with Kolar to arrive at the claimed invention?
2. Has Appellant shown that the Examiner erred in combining the teachings of Pelly with Sato to arrive at the claimed invention?

## FINDINGS OF FACT

The following findings of fact (FF) are relevant to the issues involved in the appeal.

*Pelly*

1. Pelly relates to an active filter for reducing the common mode current in the ground wire of a motor drive circuit. (Abstract.)
2. As shown in Figure 3, Pelly discloses a circuit for diverting the common mode current flow into the isolator capacitor 47 and the transistors  $Q_1$  and  $Q_2$  away from the external ground wire connected to 43a. (Col. 6, ll. 61-65.)
3. Figure 3 of Pelly is shown below:



4. Similar to Figure 1, the embodiment shown in Figure 3 includes an a-c source comprising an input terminal L and a neutral terminal N connected to the a-c input terminals of a full wave bridge connected rectifier 40. (Col. 2, 30-34.)

*Kolar*

5. Kolar relates to a voltage generator system that converts a three-phase power signal to a DC output voltage, which after filtering of switching-frequency spectral components, has a sinusoidal profile of the input current. (Col. 1, ll. 9-17.)

6. Kolar discloses that each bridge arm of the controllable three-phase bridge has identical structure and is connected to a control switch, such as a power transistor, which can be switched off. (Col. 2, ll. 12-19.)

7. Kolar further discloses that one control switch may be switched off in order to prevent current from flowing via that bridge arm, wherein the bridge arm, in its on-state, has identical characteristics to the bridge arm of a conventional diode bridge. (Col. 2, ll. 29-33.)

8. Kolar describes the advantage of controlling the conductance of this type of circuit as reduction of the output voltage of the system in comparison to conventional diode rectification, which results in reduced power supply system reactions. (Col. 2, ll. 33-37.)

9. As shown in Figure 1, Kolar discloses control transistors 12 used as the control switches of the power supply system. (Col. 6, ll. 29-39.)

*Sato*

10. Sato discloses a voltage regulator 18, which includes a three-phase full-wave rectifier 19 composed of power transistors 19a-19f. (Col. 11, ll. 7-12.)

PRINCIPLES OF LAW

Section 103 forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.”

*KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007).

“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.”

*Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161 (Fed. Cir. 2007) (quoting *KSR*, 550 U.S. at 416). “One of the ways in which a patent’s subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent’s claims.” *KSR*, 550 U.S. at 419-20. The *KSR* Court further recognized that “[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp.” *Id.* at 421.

## ANALYSIS

### *Rejection over Pelly and Kolar*

Appellant’s arguments challenge combinability of Pelly and Kolar and whether one of ordinary skill in the art would have used the power transistors of Kolar in place of the full diode bridge of Pelly (App. Br. 7-8). As asserted by the Examiner (Ans. 9), the full bridge rectifier of Pelly provides a filtered d-c output signal based on switch mode conversion of an a-c current mode input (FFs 1 and 3). Pelly further eliminates the common mode current by using an active filter (FFs 1-3). Therefore, contrary to Appellant’s assertion that nothing in the prior art teaches or suggests providing an active EMI filter at the output of the power transistor switching stage, we find that the Examiner has properly relied on Pelly for such arrangement. We further agree with the Examiner’s finding that the switching stage may comprise the power transistors taught by Kolar in place of the full wave bridge of Pelly (Ans. 9).



Initially, we find that Appellant's arguments to be directed to each reference separately, rather than the combined teachings of Pelly and Kolar as a whole. Therefore, we are unpersuaded by Appellant's contention (App. Br. 7-8; Reply Br. 4-5) that the combination is improper because Kolar includes no suggestion or description of a switching power supply placed ahead of an active EMI filter. The teaching value of Kolar is in using power transistors in the bridge arms of a controllable three-phase bridge that produces a DC output voltage after filtering of switching-frequency spectral components (FFs 5-6). The placement of the switching power supply ahead of the active filter is taught by Pelly.

We also disagree with Appellant's argument (App. Br. 8) that the references can be combined only if a suggestion or motivation to combine and a reasonable expectation of success are shown. Based on the principles outlined in *KSR*, we also agree with the Examiner's position (Ans. 10) that using a well-known switching stage made of power transistors of Kolar in place of the full wave bridge power supply of Pelly would have been obvious. In other words, we find that the Examiner properly concluded (*id.*) that one of ordinary skill in the art would have used the power transistors of Kolar with the active filter of Pelly, because Kolar teaches that such transistors may be used in place of conventional diode bridges (FFs 7 and 9) in order to reduce power supply system reactions (FF 8).

Additionally, we find that Kolar discloses one of the different types of circuits to be used as the switching stage of a power supply. As a result, the Examiner's asserted combination of the references amounts to no more than the combination of familiar elements according to known methods, yielding the predictable result of substituting the full wave bridge power supply of

Pelly with the power transistor power supply of Kolar. As such, using power transistors of Kolar presents one of the finite numbers of identified, predictable solutions, within his or her technical grasp, that a person of ordinary skill would pursue. Thus, we agree with the Examiner's conclusion that the combination of Pelly with Kolar would have rendered the subject matter of claim 8 obvious.

*Rejection over Pelly and Sato*

Appellant challenges (App. Br. 8) the combinability of Pelly and Sato by presenting arguments similar to those presented regarding Pelly and Kolar, which are discussed above and found to be unpersuasive. Similar to Kolar, Sato uses power transistors for a power supply (FF 10), which is one of the available power supply circuits one of ordinary skill in the art may use in place of the full wave bridge rectifier of Pelly. Therefore, we also agree with the Examiner that the subject matter recited in claim 8 would have been obvious over the combination of Pelly and Sato.

**CONCLUSIONS**

For the reasons discussed above and provided by the Examiner, we conclude that Appellant has not shown error in the Examiner's combination of Pelly and Kolar or Pelly and Sato. Therefore, we sustain the 35 U.S.C. § 103(a) rejections of claims 3-6 and 8-13 over Pelly and Kolar and of claims 7 and 8 over Pelly and Sato.

With respect to the rejection of claim 2 over the combination of these references with Suzuki or Ohkawa, we observe that Appellant provides no additional arguments and merely asserts (App. Br. 9) that neither Suzuki nor Ohkawa remedies the deficiencies discussed above. Therefore, we also

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sustain the 35 U.S.C. § 103(a) rejection of claim 2 over the combination of these references.

ORDER

The decision of the Examiner rejecting claims 2-13 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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